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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,029	06/22/2005	Junpei Tsuji	Q88436	8871
23373	7590	10/18/2006	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			PUTTLITZ, KARL J	
			ART UNIT	PAPER NUMBER
			1621	

DATE MAILED: 10/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/540,029

Applicant(s)

TSUJI ET AL.

Examiner

Karl J. Puttlitz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                    |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>12/21/2005</u> . | 6) <input type="checkbox"/> Other: _____   |

## **DETAILED ACTION**

### ***Specification***

A cross reference to the counterpart PCT application is required in the first sentence of the specification. Correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The word produced in claim1 is redundant since the claim already recites "to obtain a mixture containing" in connection with methyl styrene and water.

Claim 6 recites a dehydration step and a hydrogenation step, but the claim also requires that the dehydration of cumyl alcohol and the hydrogenation of methyl styrene obtained by the dehydration are carried out by a method according to any one of claims 1 to 5. Therefore, it is unclear what is required for these steps, those steps recited in claim 6 (broad), or those recited in claims 1-5 (narrower).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 3,526,674 to Becker et al. (Becker) in view of U.S. Patent No. 4,257,877 to Mahendroo (Mahendroo).

The rejected claims are drawn to process for producing cumene, which comprises supplying cumyl alcohol and hydrogen to a dehydration catalyst to obtain a mixture containing  $\alpha$ -methyl styrene and water produced and hydrogen, and supplying the mixture to a hydrogenation catalyst.

The rejected claims also cover those embodiments wherein the dehydration catalyst is activated alumina.

The rejected claims also cover those embodiments wherein the hydrogenation catalyst is a catalyst containing a metal of Group 10 or 11 of the Periodic Table, and specifically, wherein the metal is palladium or copper.

The rejected claims also cover those embodiments wherein the dehydration catalyst and the hydrogenation catalyst are packed in a single fixed-bed flow reactor.

With regard to the above embodiments, Becker teaches dehydration of cumyl alcohol to produce methyl styrenes, see column 2, lines 47-51. The process uses alumina catalysts, see column 6, lines 53+.

The difference between the process disclosed in Becker and the process covered in the rejected claims is that Becker fails to teach the step of supplying the mixture containing  $\alpha$ -methyl styrene to a hydrogenation catalyst. However, it is for this

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proposition that the examiner joins Mahendroo. Specifically, Mahendroo teaches hydrogenation of methyl styrene for the purpose of providing cumene, see column 1 lines 39-47. therefore, those of ordinary skill would have been motivated to modify the disclosure of Becker to include the claimed hydrogenation since Mahendroo teaches that this step will provide a cumene product.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 2001070710, as evidenced by counterpart U.S. Patent Application Publication No. 2003/0032822 by Tsuji et al. (Tsuji) in view of Becker and Mahendroo.

Claim 6 covers a process for producing propylene oxide, which comprises the following steps: oxidation step: a step of obtaining cumene hydroperoxide by oxidizing cumene; epoxidation step: a step of obtaining propylene oxide and cumyl alcohol by reacting cumene hydroperoxide contained in a cumene solution with propylene in an excess amount in the presence of a epoxidation catalyst in a liquid phase; dehydration step: a step of obtaining .alpha.-methyl styrene by dehydrating cumyl alcohol obtained in the epoxidation step in the presence of a dehydration catalyst; and hydrogenation step: a step of hydrogenating methyl styrene in the presence of a hydrogenation catalyst to convert into cumene and recycling it to the oxidation step as a raw material, wherein the dehydration of cumyl alcohol and the hydrogenation of .alpha.-methyl styrene obtained by the dehydration are carried out by a method according to the instant invention.

Tsuji teaches a process for producing propylene oxide, which comprises steps of:

oxidation step; a step in which isopropylbenzene is oxidized to obtain isopropylbenzene hydroperoxide,

epoxidation step; a step in which isopropylbenzene hydroperoxide obtained in the oxidation step is reacted with propylene to obtain propylene oxide and cumyl alcohol, and

hydrogenolysis step; a step in which cumyl alcohol obtained in the epoxidation step is subjected to hydrogenolysis to obtain isopropylbenzene, and said isopropylbenzene is recycled to the oxidation step as a raw material for the oxidation step.

Tsuji fails to teach the required step of dehydrating cumyl alcohol followed by hydrogenation to provide cumene. It is for this proposition that the examiner joins Becker and Mahendroo, which, as established above, teach these steps for the purpose of providing cumene, and are thus well within the motivation of those of ordinary skill, and therefore, prima facie obvious.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422

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F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claim 6 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-2 of Tsuji in view of Becker and Mahendroo. Tsuji claims a process for producing propylene oxide. Although Tsuji fails to recite a dehydration step followed by hydrogenation to provide cumene, Becker and Mahendroo teach these steps for the purpose of providing cumene, and are thus well within the motivation of those of ordinary skill, and therefore, prima facie obvious.

This is a provisional obviousness-type double patenting rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl J. Puttlitz whose telephone number is (571) 272-0645. The examiner can normally be reached on Monday to Friday from 9 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thurman K. Page, can be reached at telephone number (571) 272-0602.

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The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'K. Puttlitz', is written over the printed name.

Karl J. Puttlitz  
*Assistant Examiner*